

REMARKS

This Request for Continued Examination (RCE) and Amendment are in response to the Advisory Office Action dated August 8, 2006.

Amendments to the claims (amended, cancelled and new claims)

Claims 1, 3-6, 8-9, and 11-27 are currently pending in the application, with claims 17-25 having been previously withdrawn.

Claims 1, 8, 11-12 and 26 have been amended herein. Specifically:

- Claim 1 has been amended to recite the additional elements of a printing carriage (previously recited in claim 10), a printhead, a milling system (previously recited in claim 7), and the relative positions of the printhead, the milling system, and the (previously recited) curing system on the printing carriage. Support for this amendment is found in the specification at least at page 9 (line 26) through page 10 (line 2), as well as in Fig. 2 (items 18, 20a and 20b, 22 and 24). Claim 1 has been further amended to remove extraneous functional language, consistent with the Examiner's remarks at page 3 of the Advisory Action (dated August 8, 2006), and page 5 (last paragraph) and page 6 (first paragraph) of the Final Office action dated May 15, 2006.
- Claims 8, 11 and 12 have been amended to correct their dependencies in light of the cancellations of claims 7 and 10 and the amendments to claim 1.
- Claim 26 has been amended in a form similar to the amendments to claim 1.

Claims 7 and 10 have been cancelled because it is believed that they are potentially redundant in light of the above amendments to claim 1. Notwithstanding, the cancellation of claims 7 and 10 is made without prejudice to reassert such claims at a later date, and should not be considered as an acknowledgment that those claims were or are unpatentable.

Claim 27 is newly added. Support for new claim 27 can be found in the specification at page 10 (lines 12-14) and in Fig. 2.

No new matter has been added to the claims beyond the original specification by way of amendment or the addition of new claims, as evidenced above. The amendments and cancellation of claims are made without prejudice or disclaimer.

Previous rejection of claims 1, 3-16 and 26 under 35 USC 102(b)

In the Final Office action dated May 15, 2005, claims 1, 3-16 and 26 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent number 6,841,116 (“Schmidt”).

The relevant independent claims are claims 1 and 26. It is axiomatic that if an independent claim is allowable, then any dependent claim (which depends from the allowable independent claim) should also be allowable. Accordingly, the Applicant will present only arguments directed towards claims 1 and 26 below, as the Applicant believes those claims, as currently amended, to be allowable over the prior art. Specifically:

Background: As a starting point, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claim 1: With respect to claim 1, that claim has now been amended to read as follows:

A solid freeform fabrication system for producing a three-dimensional object, comprising:
a printing carriage;
a dispensing system comprising a printhead, the dispensing system being adapted to separately dispense build material and support material, said

dispensing system being an ink-jet printing dispensing system;
a curing system adapted to harden the build material after being dispensed
but before the support material is dispensed;
a milling system adapted to mill the build material after being dispensed
but before being hardened; and
wherein the printhead, the curing system, and the milling system are all
supported by the printing carriage, and the milling system is positioned
between the printhead and the curing system.
(Emphasis added.)

As can be seen from an examination of Fig. 1 of Schmidt, in Schmidt the “milling system” (item 32) is not positioned between the printhead (item 24) and the “curing system” (item 38), as is now required by Applicant’s claim 1. Applicant’s claim 1 now therefore recites a limitation not shown by Schmidt. Accordingly, claim 1 should now be allowed over Schmidt. As it is axiomatic that, if an independent claim is allowable then any dependent claim (which depends from the allowable independent claim) should also be allowable, and current claims 3-6, 8-9, and 11-16 depend (either directly or indirectly) from claim 1, then those claims should be allowable as well.

While U.S. Patent No. 5,287,435 (“Cohen”) was not used to reject claim 1 under 35 USC 102(b), the Applicant believes it is appropriate to address that reference, in view of amended claim 1, at this time. Specifically, in Cohen it is noted that the “milling system” (item 140 of Fig. 1) is not positioned between the printhead (items 90, 110 and 120) and the “curing system” (item 80), as is now required by Applicant’s claim 1. Accordingly, Applicant’s claim 1 now recites a limitation not shown by Cohen.

Claim 26: With respect to claim 26, that claim has now been amended to read as follows:

A solid freeform fabrication system for producing a three-dimensional object, comprising:

dispensing means for separately dispensing build material and support material, said dispensing means being a ink-jet printing dispensing means;

means for hardening the build material after being dispensed but before the support material is dispensed;

milling means for milling the build material after being dispensed but before being hardened; and

wherein the dispensing means, the means for hardening the build material, and the milling means are all supported on a common carriage, and the milling means is positioned *between* the dispensing means and the means for hardening the build material.

(Emphasis added.)

As can be seen from an examination of Fig. 1 of Schmidt, in Schmidt the “milling means” (item 32) is not positioned between the “dispensing means” (item 24) and the “means for hardening the build material” (item 38), as is now required by Applicant’s claim 26. Accordingly, Applicant’s claim 26 now recites a limitation not shown by Schmidt. Further, similar arguments presented above regarding (amended) claim 1 and Cohen apply equally to amended claim 26 and Cohen.

Non-Obviousness over Schmidt and Cohen: The Applicant further contends that the arrangement recited in (amended) claims 1 and 26 is not obvious in light of Schmidt and/or Cohen. Specifically, the now-recited arrangement in claim 1 that “the milling system is positioned *between* the printhead and the curing system” (and in claim 26 that “the milling means is positioned *between* the dispensing means and the means for hardening the build material”) allows for the Applicant’s claimed apparatus to be used in an efficient manner to accomplish the method as recited in claims 17-25. That is, the apparatus of claims 1 and 26 can accomplish the sequential deposition and curing of build material and support material (in order to achieve a cleaner interface there between) without additional extraneous movement of either the work-piece, or the components used to fabricate the work-piece, as would be required by using either the apparatus of Schmidt or Cohen to accomplish the same method. Certainly nothing within Schmidt and/or Cohen suggests arranging the deposition system, the curing system, and the milling system in the same arrangement as is recited in Applicant’s (now-amended) claims 1 and 26. Further, nothing within Schmidt and/or Cohen suggests

using their disclosed systems for sequentially depositing and curing the build material and support material. Rather, in both instances (Schmidt and Cohen), the only described method for building a 3D model is to apply both the build material and the support material to a build platform, and thereafter curing the entire 3D model. Further, the apparatuses described by Schmidt and Cohen are particularly suited for performing their recited methods of building a 3D model (i.e., applying both the build material and the support material to a build platform, and thereafter curing the entire 3D model). As can be seen, using the apparatus (system) recited by the Applicant in (amended) claims 1 and 26 to accomplish the methods for building a 3D model, in the manner described by Schmidt and Cohen, would result in extraneous movement of either the work-piece or the apparatus used to fabricate the work-piece. Accordingly, while certain “functional” language in claims 1 and 26, with respect to this advantageous aspect of the Applicant’s claimed invention, has now been removed from those claims, it should be understood (and appreciated) that the recited arrangement of the elements within those claims allows for advantageous use of the claimed apparatus in ways not taught nor suggested by either Schmidt or Cohen. That is, the recited arrangement of the components in Applicant’s claims 1 and 26 (e.g., in claim 1 that “the milling system is positioned between the printhead and the curing system”) is not a mere “rearrangement of parts”, since a similar “rearrangement of parts” of the apparatuses of Schmidt and Cohen would result in a less efficient method for carrying out their disclosed methods for using their respective apparatuses. Put another way, if the apparatuses of Schmidt and Cohen were modified in the manner according to the Applicant’s now-amended claims 1 and 26, and were used according to the methods set forth by Schmidt and Cohen in their respective disclosures, such apparatuses would be less efficient in performing those disclosed methods of operation. Therefore, there would be no incentive (and every *disincentive*) for one skilled in the art to modify the apparatuses of Schmidt and/or Cohen to conform to the apparatus (system) of Applicant’s (amended) claims 1 and 26 in order to carry out the methods disclosed by Schmidt and Cohen, as such modifications would result in a less efficient manner of carrying out their disclosed methods.

In short: (1) the apparatus (system) recited in Applicant’s (amended) claims 1 and 26 is particularly suited to performing the intended method of use of such apparatus (as per withdrawn claims 17-25); (2) the apparatuses described by Schmidt and Cohen are not

particularly suited to performing the Applicant's intended methods of use (and are, in fact, particularly ill-suited for performing such use (as set forth in Applicant's claims 17-25)); (3) Schmidt and Cohen only teach methods of use of their respective apparatuses which are consistent with their disclosed apparatuses; and (4) the methods of use taught by Schmidt and Cohen are inconsistent with the Applicant's disclosed apparatus.

Put another way, absent the method teachings of the Applicant's current disclosure (which the Applicant believes to be novel and non-obvious), one would not be motivated to modify Schmidt and/or Cohen to achieve the Applicant's claims 1 and 26, as doing so would be contrary to the teachings of Schmidt and Cohen themselves. (That is, the apparatus provided in claims 1 and 26 (as amended) would provide a less efficient apparatus for performing the methods of forming a 3D model as is disclosed in Schmidt and Cohen.)

Conclusion: For at least these reasons the Applicant contends that claims 1 and 26, as amended, now recite novel, non-obvious, limitations over Schmidt (as well as Cohen). The Applicant therefore requests that the rejection of claims 1 and 26 as being anticipated by Schmidt now be removed and the claims allowed. As it is axiomatic that a claim which depends from an allowable base claim is also allowable, and since claims 3-6, 8-9, and 11-16 all depend from claim 1 (either directly or indirectly), then claims 3-6, 8-9, and 11-16 should also be allowable.

Previous rejection of claims 7-10 under 35 USC 103(b)

In the Final Office action dated May 15, 2005, claims 7-10 were rejected under 35 U.S.C. § 103(a) as being anticipated by U.S. Patent number 6,841,116 ("Schmidt") in view of U.S. Patent No. 5,287,435 ("Cohen").

As claims 7 and 10 are now hereby cancelled, the previous rejection of those claims under 35 U.S.C. § 103(a) is now moot.

With respect to claims 8-9, those claims depend (either directly or indirectly) from claim 1. As argued above, the Applicant believes that amended claim 1 is now allowable. As it is axiomatic that a claim which depends from an allowable base claim is also allowable, and since claims 8 and 9 both depend from claim 1 (either directly or indirectly), then claims 8-9 should now also be allowable.

Request for Extension of Time Under 35 U.S.C. § 1.136(a)

The Applicant hereby requests a two (2) month extension of time, under 35 U.S.C. § 1.136(a), to respond to the Final Office action of May 15, 2006 (and the Advisory Action of August 8, 2006), to and through October 15, 2006. The fee for the extension is to be charged to Applicant's Deposit Account number 08-2025.

Summary

The Applicant believes that this response constitutes a full and complete response to the Final Office Action dated May 16, 2006, as well as a complete submission to accompany Request for Continued Examination in accordance with 37 CFR 1.114. Therefore, the Applicant respectfully requests examination on the merits of claims 1, 3-6, 8-9, and 11-16, and 26-27, as provided above, and timely allowance thereof.

The Examiner is respectfully requested to contact the below-signed representative if the Examiner believes this will facilitate prosecution toward allowance of the claims.

Respectfully submitted,
Jeffrey A. Nielsen

Date: September 26, 2006

By John S. Reid
John S. Reid
Attorney and agent for Applicant
Reg. No. 36,369
Phone: (509) 534-5789

Please continue to send all future correspondence to:

Hewlett-Packard Development Company, L.P.
Intellectual Property Administration
P.O. Box 272400
Fort Collins, Colorado 80527-2400